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(72) Inventor: **de Volder, Laurent**  
**9880 Maria-Aalter (BE)**

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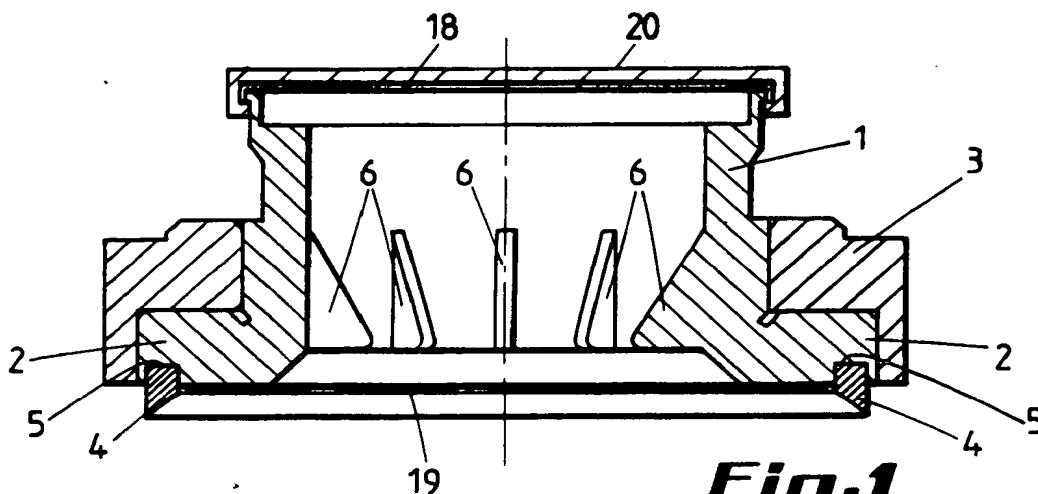
(74) Representative: **Pieraerts, Jacques et al**  
**GEVERS Patents,**  
**Brussels Airport Business Park,**  
**Holidaystraat 5**  
**1831 Diegem (BE)**

(71) Applicant: **PRINTING INTERNATIONAL**  
**9880 Aalter (BE)**

### (54) Ink cartridge with a squeegee

(57) The invention relates to an ink cartridge with a circular or oval squeegee (4) from a hard material, such as hard metal, ceramics or plastics, characterised in that it consists of an ink reservoir in the form of a monolithic component (1) from non deformable material hav-

ing such properties that a circular or oval channel (5) can be provided therein for fixing said squeegee by clicking and/or by gluing to this component.



**Fig.1**

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## Description

The present invention relates to an ink cartridge with a circular or oval squeegee from a hard material, such as hard metal, ceramics or plastics.

Different designs of ink cartridges are known at present, some of which show a more or less complicated structure for removably mounting the squeegee. There are also known ink cartridges wherein a flexible component is mounted between the component onto which a squeegee is fixed and the actual ink reservoir.

An object of the invention is to provide an ink cartridge which can be used as a disposable unit and which can be designed to enable the squeegees to be exchanged in an easy and technically reliable manner.

To enable this object of the invention, the ink cartridge according to the invention consists of an ink reservoir in the form of a monolithic component from non deformable material having such properties that a circular or oval channel can be provided therein for fixing said squeegee by clicking and/or by gluing to this component.

In a particularly attractive embodiment, said non deformable material is a synthetic material, for example a polyacetal material.

A detail of the invention consists in that said monolithic component is internally provided with cooling ribs.

Still according to a remarkable embodiment of the invention, channels are provided in the monolithic component for circulating a cooling fluid.

A first embodiment of the invention is characterised by the fact that said ink reservoir comprises at the bottom two laterally extending projections which are situated diametrically to one another and onto which the required mechanical pressure can be exerted by means of a rigid and non deformable press plate.

According to another remarkable embodiment, said component comprises an internal hollow chamber onto the bottom of which a downwards directed mechanical pressure can be exerted.

Other details and advantages of the invention will become apparent from the following description of an ink cartridge with a circular or oval squeegee, according to the invention. This description is only given by way of example and does not limit the invention. The reference numerals relate to the figures annexed hereto.

Figure 1 is a cross sectional view of an ink reservoir according to the invention, in a first possible embodiment.

Figure 2 is a top view on the rigid, non deformable press plate to be used with such an ink reservoir.

Figure 3 is a cross sectional view of a variant of the invention.

The ink cartridge, illustrated in Figures 1 and 2, consists essentially of a monolithic component 1, which forms the actual ink reservoir. At the bottom, i.e. considered in the use position, the monolithic component shows laterally two projections 2 which extend outwardly opposite to one another and onto which a downward pressure can be exerted by means of a rigid, non

deformable press plate 3. The press plate 3 itself receives its downward pressure from a forklike component which pertains to the printing device itself and which therefore does essentially not pertain to the currently described invention.

At the bottom, still considered in the use position, the monolithic component 1 shows a circular or oval channel adapted to the profile of the circular or oval squeegee 4.

Since an essential characteristic of the invention consists in the choice of the material from which the monolithic component is made, the squeegee 4 can either be clicked in the channel 5 provided in the monolithic component by a snapping or clicking operation and/or be glued therein. A material which shows remarkable properties for forming the monolithic component 1 is a polyacetal.

It can therefore also be proposed to fix the squeegee in one spray or moulding process to the monolithic component 1 which forms the ink reservoir.

In the ink reservoir according to Figure 1, cooling ribs 6 are internally provided.

Such cooling ribs may be useful when the monolithic component, although made of a synthetic material, would be heated up as a result of a prolonged operation of the ink cartridge.

Although the ink cartridge according to Figure 3 is constructed according to another principle, the structure according to this variant has been designed in such a manner that use can also be made here of polyacetal for forming the monolithic component 10 to which the squeegee 11 is fixed, considered in the use position, at the bottom.

The space containing the ink is indicated with reference number 12 and is in communication with the bottom space 12' through the intermediary of a narrowing 12'.

In the middle of the ink cartridge, a chamber 13 is provided, onto the bottom of which a downward pressure can be exerted. This pressure is of course immediately transferred to the squeegee 11. Use can be made hereto of a ball 14. The means for exerting onto this ball and thus onto the ink cartridge the required downward pressure, have not been shown.

Through the wall of the monolithic component which forms the ink reservoir, an ink supply duct 15 is provided which can be connected to a non shown ink supply. The cylindrical wall 16, which surrounds the chamber 13, can be cooled down by a cooling fluid which circulates for example through a schematically illustrated serpentine 17.

It is clear that here also the squeegee 11 can be clicked, glued or can be joined, during a spray or moulding process, to the material the monolithic component consists of, at the bottom in a circular or oval channel, provided in the wall of the monolithic component 10.

In the embodiments according to Figures 1 and 3, the ink reservoir is enclosed both at the top and at the

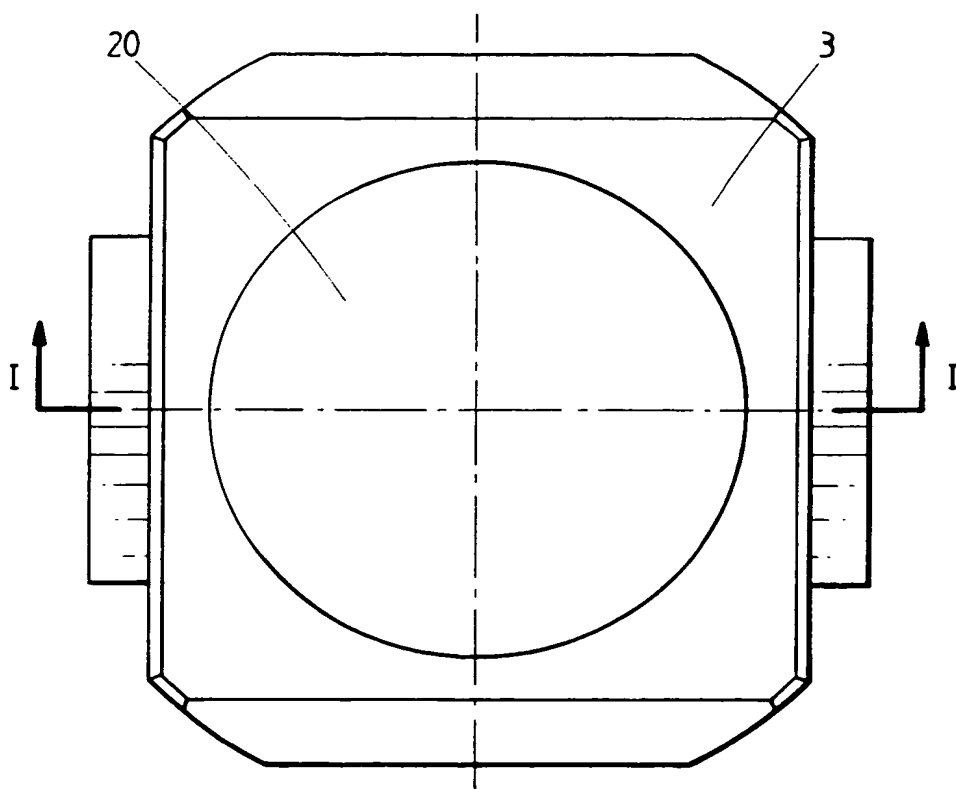
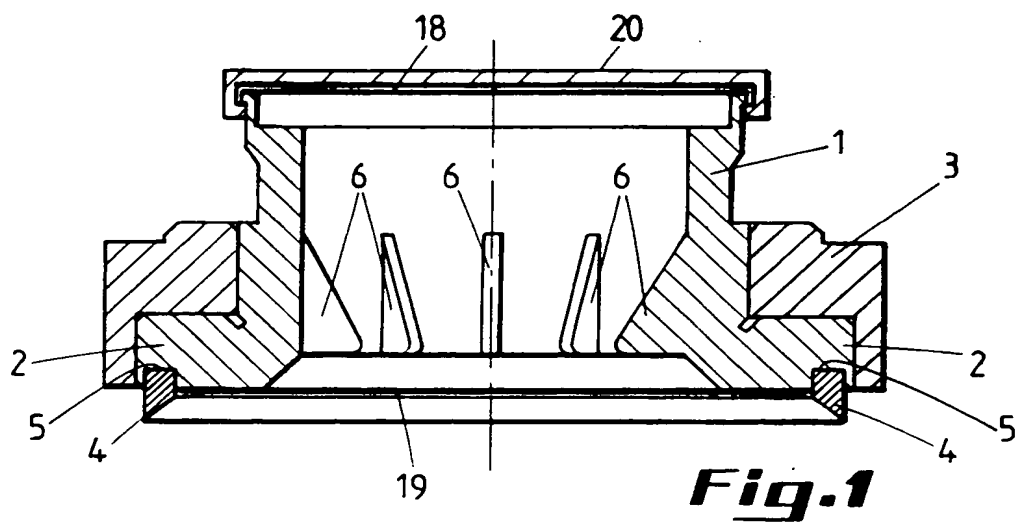
bottom by removable sealing films or sealing plates 18 and 19, respectively. At least on the upper side, the ink cartridge is in both cases also closed off by a cover 20.

The choice of the material from which the monolithic component is made, allows from a technical-economical point of view to consider the ink cartridge according to the invention as a disposable entity. Thanks to the properties of the synthetic material used therefor, it is just as well possible to join the squeegees 4 and 14, respectively, to the monolithic component by snapping or clicking them therein, by gluing the squeegee thereto or by uniting them in one operation during the spray or moulding process into one entity.

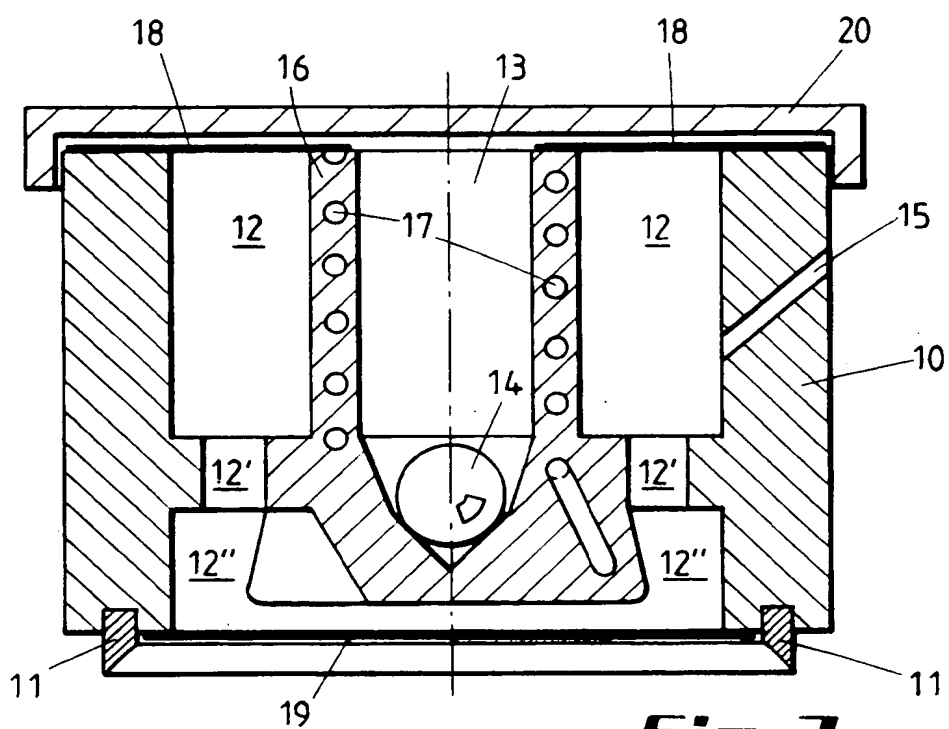
The invention is not limited to the embodiment described hereinabove and modifications could be applied thereto, insofar they fall within the scope of the claims annexed hereto.

### Claims

1. An ink cartridge with a circular or oval squeegee from a hard material, such as hard metal, ceramics or plastics, characterised in that it consists of an ink reservoir in the form of a monolithic component from non deformable material having such properties that a circular or oval channel can be provided therein for fixing said squeegee by clicking and/or by gluing to this component.
2. An ink cartridge according to claim 1, characterised in that said non deformable material is a synthetic material.
3. An ink cartridge according to claim 2, characterised in that said synthetic material is a polyacetal material.
4. An ink cartridge according to either one of the claims 2 and 3, characterised in that said squeegee from said hard material is fixed to the monolithic component by means of an adhesive.
5. An ink cartridge according to either one of the claims 2 and 3, characterised in that said squeegee from said hard material is fixed to the monolithic component by snapping or clicking it therein.
6. An ink cartridge according to either one of the claims 2 and 3, characterised in that said squeegee has been fixed to said ink cartridge when spraying or moulding said synthetic material from which said ink cartridge is made.
7. An ink cartridge according to any one of the claims 1 to 6, characterised in that said monolithic component is internally provided with cooling ribs.
8. An ink cartridge according to claim 7, characterised in that channels are provided both in said cooling ribs and in the monolithic component for circulating a cooling fluid.
9. An ink cartridge according to any one of the claims 1 to 8, characterised in that said component is provided with an external collar onto which a downwards directed mechanical pressure can be exerted.
10. An ink cartridge according to claim 9, characterised in that said ink reservoir comprises at the bottom two laterally extending projections which are situated diametrically to one another and onto which the required mechanical pressure can be exerted by means of a rigid and non deformable press plate.
11. An ink cartridge according to any one of the claims 1 to 8, characterised in that said component comprises an internal hollow chamber onto the bottom of which a downwards directed mechanical pressure can be exerted.
12. An ink cartridge according to claim 11, characterised in that said hollow chamber is externally provided with cooling ribs.
13. An ink cartridge according to any one of the claims 1 to 11, characterised in that an ink supply duct connects the interior of said ink reservoir with an ink supply.
14. An ink cartridge according to any one of the claims 1 to 12, characterised in that said ink reservoir is provided on both extremities with a removable sealing film or sealing plate.



**Fig. 2**



**Fig. 3**



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# EUROPEAN SEARCH REPORT

Application Number  
EP 96 20 0793

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	WO-A-91 17888 (TAMPOFLEX GMBH) 28 November 1991	1-6, 9-11, 13	B41F17/00
A	* the whole document *	7,8,12, 14	
A	--- EP-A-0 474 262 (TAMPOPRINT GMBH) 11 March 1992	1-14	
A	--- EP-A-0 568 133 (TAMPOGRAF S A S DI J E TAYLOR) 3 November 1993	1-14	
A	--- DE-U-92 13 261 (TAMPOPRINT GMBH) 21 January 1993	7,8,12	
	* the whole document *		
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			B41F
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		30 July 1996	Madsen, P
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